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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Applicants	:	Eric P. Gibbs et al.
Application No.	:	09/975,749
Filed	:	October 10, 2001
For	:	SYSTEM AND METHOD FOR DATA TRANSFER OPTIMIZATION IN A PORTABLE AUDIO DEVICE
Examiner	:	Daniel R. Sellers
Art Unit	:	2644
Docket No.	:	35073.002
Date	:	May 14, 2007

APPEAL BRIEF

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Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Examiner, in an Office Action mailed December 13, 2007, finally rejecting claims 28-37.

REAL PARTY IN INTEREST

The real party in interest is Mark E. Phillips having an address of 720 – 3rd Ave., Suite 1100, Seattle, Washington 98104.

RELATED APPEALS AND INTERFERENCES

Applicant's representative has not identified, and does not know of, any other appeals of interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 28-37 are pending in the application. Claims 28-37 were finally rejected in the Office Action dated December 13, 2007. Applicants' appeal the final rejection of claims 28-37, which are copied in the attached CLAIMS APPENDIX.

STATUS OF AMENDMENTS

No Amendment After Final is enclosed with this brief. The last Amendment was filed May 4, 2007.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 28

Claim 28 is directed to a portable media player (Page 3, lines 15-28; 100 in Figure 1) that includes a processor (102), a random-access-memory component (104), a codec component (114), a non-volatile, mass-storage component (126), and a battery power supply (132). The processor executes commands. The random-access-memory component stores compressed data in more than two different random-access-memory buffer areas (Page 12, lines 4-14), each random-access-memory buffer lockable and unlockable by the processor (Page 17, line 26 - page 18, line 7). The codec component, controlled by the processor, reads compressed data from a locked random-access-memory buffer. The locked random-access-memory buffer is selected from among the more than two different random-access-memory buffer areas and is locked by the processor to prevent writing of the locked random-access-memory buffer by another component. The codec component generates a decompressed signal from the compressed data (Page 4, lines 26-29) that is, in turn, rendered by a data-rendering component (Page 5, lines 19-27). The non-volatile mass-storage component stores compressed data and that writes compressed data, under control of the processor, to unlocked random-access-memory buffers (Page 6, lines 5-16). The battery power supply provides electrical power to the processor, random-access memory component, codec component, data-rendering component, and non-volatile, mass-storage component (page 6, line 24 - page 7, line 2).

Dependent Claims 29-37

Claim 29 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 28 wherein the processor (102) continuously monitors progress of the codec component (114) in decompressing data in order to power up the non-volatile, mass-storage component (126), direct the non-volatile, mass-storage component to write additional compressed data to multiple random-access-memory buffers (104) and redirect the codec component to read the additional compressed data from the multiple random-access-memory buffers so that the codec component can continue to generate a decompressed signal without interruption, and power-down the non-volatile, mass-storage component (Page 9, line 29 - page 10, line 6). Claim 30 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor, following reception of a fast-forward command that redirects rendering, by the data-rendering component, of compressed data starting at a desired location within a compressed-data sequence not currently stored within the more than two different random-access-memory buffer areas, directs the non-volatile, mass-storage component to write compressed data, starting at a location prior to the desired location in the compressed-data stream and ending at a location following the desired location in the compressed-data stream, to multiple random-access-memory buffers (Page 15, lines 9-25). Claim 31 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor, following reception of a rewind command that redirects rendering, by the data-rendering component, of compressed data starting at a desired location within a compressed-data sequence not currently stored within the more than two different random-access-memory buffer areas, directs the non-volatile, mass-storage component to write compressed data, starting at a location prior to the desired location in the compressed-data stream and ending at a location following the desired location in the compressed-data stream, to multiple random-access-memory buffers (e.g., page 15, line 26 - page 16, line 11). Claim 32 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor, following reception of a rewind command that redirects rendering, by the data-rendering component, of compressed data starting at a desired location within a compressed-data sequence not currently stored within the more than two different random-access-memory buffer areas, directs the non-volatile, mass-storage component to write compressed data, starting at a location prior to the desired location in the

compressed-data stream and ending at a location at which subsequent compressed-data of the compressed-data sequence is already stored in the more than two different random-access-memory buffer areas, to multiple random-access-memory buffers (Page 14, lines 4-24). Claim 33 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor, following reception of a fast-forward command, predicts portions of a compressed-data sequence that are likely to be accessed by additional fast-forward commands and directs the non-volatile, mass-storage component to write predicted portions of the compressed data to multiple random-access-memory buffers (Page 16, lines 12-21). Claim 34 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor minimizes the number of times that the processor powers up the non-volatile, mass-storage component (Page 3, lines 2-14). Claim 35 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor minimizes the duration of time during which the non-volatile, mass-storage component is powered up (Page 3, lines 2-14). Claim 36 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the processor locks only a single random-access-memory buffer at any point in time (Page 17, line 26 - page 18, line 27). Claim 37 is directed to the portable media player (Page 3, lines 15-28; 100 in Figure 1) of claim 29 wherein the compressed data is a compressed audio signal and the decompressed signal is a decompressed audio signal.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. The rejection of claims 28-37 under 35 U.S.C. §103(a) as being unpatentable over Birrell et al., U.S. Patent No. 6,332,175 B1 in view of Biliris et al., U.S. Patent No. 5,720,037.

ARGUMENT

Claims 28-37 are pending in the current application. In an Office Action dated February 13, 2007, the Examiner rejected claims 28-37 under 35 U.S.C. §103(a) as being unpatentable over Birrell et al., U.S. Patent No. 6,332,175 B1 ("Birrell") in view of Biliris et al., U.S. Patent No. 5,720,037 ("Biliris"). Applicants respectfully traverse the 35 U.S.C. §103(a) rejections of claims 28-37.

ISSUE 1

1. The rejection of claims 28-37 under 35 U.S.C. §103(a) as being unpatentable over Birrell et al., U.S. Patent No. 6,332,175 B1 in view of Biliris et al., U.S. Patent No. 5,720,037.

Claim 28 is the only independent claim in claims 28-37 currently pending. Applicants therefore focus the following arguments on claim 28 because, as discussed below, the Examiner has failed to establish a *prima facie* obviousness-type rejection of claim 28, and claims 29-37, which depend from claim 28, are therefore also not obvious in view of Birrell, Biliris, or a combination of Birrell and Biliris.

Claim 28 is provided below, for the reader's convenience:

> 28. A portable media player comprising:
>
> a processor that executes commands;
>
> a random-access-memory component that stores compressed data in more than two different random-access-memory buffer areas, each random-access-memory buffer *lockable and unlockable* by the processor;
>
> a codec component, controlled by the processor, that reads compressed data from a *locked* random-access-memory buffer, the *locked* random-access-memory buffer selected from among the more than two different random-access-memory buffer areas and *locked* by the processor to prevent writing of the locked random-access-memory buffer by another component, and that generates a decompressed signal from the read compressed data that is rendered by a data-rendering component;
>
> a non-volatile, mass-storage component that stores compressed data and that writes compressed data, under control of the processor, to *unlocked* random-access-memory buffers; and
>
> a battery power supply to provide electrical power to the processor, random-access memory component, codec component, data-rendering component, and non-volatile, mass-storage component. (emphasis added)

The portable media player to which claim 28 is directed includes a random-access-memory component that stores compressed data in more than two different random-access memory buffer areas, each random-access-memory buffer *locked* and *unlocked* by a processor; a codec component that reads compressed data from a *locked* random-access-memory buffer; and a mass-storage component that writes compressed data, under control of the processor, to *unlocked* random-access-memory buffers. Please note that, as emphasize din the preceding sentence, the locking and unlocking of individual random-access-memory buffer areas, as well as the locking states of these buffers, is mentioned in three of the five elements of claim 28, and that activities of the codec component and mass-storage component are constrained

by the locking states of random-access-memory buffers. The fine-granularity locking used in the claimed portable media player is responsible for significant efficiency of the portable media player, as discussed in the final paragraph of page 17 of the current application, beginning on line 26, that continues onto the first seven lines of page 18:

> Part of the efficiency provided by the buffering techniques of the system 100 is that only one buffer is "Locked" for a reading to the CODEC 114 while the other buffers are available for read/write operations. In the examples illustrated in Figures 4-9, sixteen buffers are allocated as part of the buffer 124. Thus, only 1/16 of the total buffer space is locked for data transfer to the CODEC 114 and is thus unavailable for other read/write operations. However, the remaining 15/16 of the total buffer space are available to be filled each time the storage device 126 is activated. Such operation is in sharp contrast to a typical buffering operation in which a buffer is allocated into two portions with only one-half of the buffer space available for read/write operations while the other half of the buffer space is locked for data transfer operations to the CODEC.

On page 2 of the Office Action, the Examiner cites Birrell as teaching the random-access-memory component, codec component, and non-volatile, mass-storage component of the embodiment of the present invention to which claim 28 is directed. As noted above, each of these three elements of claim 28 includes language directed to the random-access-memory-buffer locking employed in the portable media player embodiment to which claim 28 is directed. In particular, claim 28 explicitly recites that each random-access-memory buffer is lockable and unlockable by the processor, that the codec component reads compressed data from a locked random-access-memory buffer, and that the mass-storage component writes compressed data, under control of the processor, to unlocked random-access-memory buffers. Applicants' representative can find no teaching, mention, or even suggestion of locking in Birrell. Applicants' representative has carefully read the portions of Birrell cited by the Examiner in section 3 of the Office Action, and cannot find a single mention or suggestion of memory-buffer locking of any kind. Applicants' representative has carefully read the portions of Biliris cited by the Examiner in section 3 of the Office Action and cannot find any teaching, mention, or suggestion of memory-buffer locking in Biliris. According to M.P.E.P. §2142, "the prior art reference (or references when combined) must teach or suggest all the claim limitations" in order to establish a *prima facie* case of obviousness. Because neither Birrell nor Biliris teach, mention, or suggest memory-buffer locking, the combination of Birrell and Biliris cannot possibly teach, mention, or suggest all

of the elements of claim 28, three of which contain language directed to random-access-memory-buffer locking and constraints on the codec and mass-storage device emanating from the locked or unlocked state of the multiple random-access-memory buffers employed in the embodiment of the portable media player to which claim 28 is directed.

In section 3 of the Office Action, the Examiner states:

> It is inherent that a portion of RAM is locked, and the processor prevents the data to be overwritten. Likewise, it is inherent that a portion of the RAM is unlocked, and the processor allows data from the mass-storage component to be written to the RAM.

It is not in any way inherent that a portable media player, or any other type of electronic device, employs locking in order to coordinate access to memory buffers by multiple accessing entities. There are many different methods by which such access may be coordinated. For example, each of the accessing entities may refer to memory registers or tables indicating the amount of data currently resident within buffers that is accessible to each of the accessing components, and the accessing components may be implemented to adhere to access protocols that prevent contention for memory buffers. Many systems operate in this fashion, and require no locking. In alternative methods, contention for memory buffers may be eliminated by careful monitoring of accessing-entity activities, so that a reading entity is never allowed to read ahead of a different, writing entity. The monitoring may be accompanied by time-slice allocation, for example, to eliminate the possible of contention for a shared resource, such as a memory buffer. As discussed in the current application, even in those systems that do employ locking, one-half of the memory is generally locked and another one-half of the memory is unlocked, at any given period of time. However, as pointed out in the above-quoted passage from the current application, such locking schemes may be quite inefficient.

There are many well-known schemes for controlling access to a shared resource that do not involve locking of the shared resource. Locking implies use of semaphores and spin locks, or other such mechanisms that, in general, result in a significant number of processor cycles expended for obtaining locks, and that may also result in large latencies due to significant idle times for certain of the entities contending for a locked resource. Designers of such systems generally carefully assess the overheads and benefits of various resource-contention-management schemes in order to select an appropriate scheme for a particular application. In certain cases, designers do, in fact, choose to employ one of

many different types of locking scheme after determining that the locking overhead is offset by other advantages in system implementation. The Examiner is entirely incorrect in assuming that the memory-buffer-locking method recite din claim 28 is somehow inherent in either Birrell or Biliris, and the fact that neither reference even mentions locking would indicate that any of numerous alternative resource-contention-management schemes may be employed in these systems, or that, in fact, no resource-contention-management scheme is employed in Birilis' and Birrell's devices, because they are designed to avoid the possibility of shared-resource contention. The Examiner is not free to ignore claim language directed to memory-buffer locking in claim 28 by declaring locking to be inherent, when, in fact, Birrell and Biliris may have chosen any of numerous alternative means for avoiding contention for memory by multiple accessing entities, and when, even had they chosen locking, they may employ any of numerous locking methods on which claim 28 does not read.

In section 11 of the Office Action, the Examiner again cites Birrell as teaching "that buffers that are needed for rewind are locked and only accessible by read commands." Birrell teaches nothing of the sort. Applicants' representative can find no teaching, mention, or suggestion for locking in Burrell.

In the Office Action, the Examiner states, in section 3 of the Office Action that, "[o]ne of ordinary skill at the time of the invention would be motivated to use a plurality of buffers, with associated start and end addresses in memory, so that the processor can issue seek commands more efficiently, by skipping to the beginning of one of many buffers in a circular queue separated by a defined granularity." This justification for combining Biliris and Birrell makes absolutely no sense. Birrell does not teach, mention, or suggest any deficiency or inefficiency in Birrell's memory-access operations. In fact, using a single random-access memory, rather than multiple buffers, allows Birrell to issue fewer seek commands. Skipping to the beginning of one of many buffers in a circular queue has really nothing at all to do with processor efficiency, and the phrase "circular queue separated by a defined granularity" is incomprehensible. Circular queues are not separated by a defined granularity, but are instead a type of queue for holding discrete objects, such as memory buffers, messages, or other data that may be related only be the time of their arrival at a queuing mechanism. In Applicants' representative's respectfully offered opinion, the Examiner has failed to offer a rational or even understandable justification for the combination of Birrell and Biliris.

CONCLUSION

As discussed above, claim 28, and claims 29-37 that depend from claim 28, include three elements that explicitly recite aspects of memory-access-buffer locking. Neither Biliris nor Birrell teaches, mentions, or even suggests random-access-memory-buffer locking. Locking of memory buffers is not inherent in an electronic device. There are many different alternatives for controlling contention by multiple entities for a shared resource that do not involve locking the shared resource. The particular locking method employed in the embodiment of the present invention to which claim 28 is directed is not at all inherent in a portable media player, as discussed in the above-quoted portion of the current application. Finally, the Examiner's justification for combining Biliris and Birrell makes no sense from a technological standpoint. The Examiner has failed to make a *prima facie* case of obviousness which, according to M.P.E.P. §2142, requires that the Examiner find a teaching or suggestion for all claim limitations in the references combined for the rejection.

Applicant respectfully submits that all statutory requirements are met and that the present application is allowable over all the references of record. Therefore, Applicant respectfully requests that the present application be passed to issue.

Respectfully submitted,

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CLAIMS APPENDIX

1-27 Cancelled

28. (previously presented) A portable media player comprising:

a processor that executes commands;

a random-access-memory component that stores compressed data in more than two different random-access-memory buffer areas, each random-access-memory buffer lockable and unlockable by the processor;

a codec component, controlled by the processor, that reads compressed data from a locked random-access-memory buffer, the locked random-access-memory buffer selected from among the more than two different random-access-memory buffer areas and locked by the processor to prevent writing of the locked random-access-memory buffer by another component, and that generates a decompressed signal from the read compressed data that is rendered by a data-rendering component;

a non-volatile, mass-storage component that stores compressed data and that writes compressed data, under control of the processor, to unlocked random-access-memory buffers; and

a battery power supply to provide electrical power to the processor, random-access memory component, codec component, data-rendering component, and non-volatile, mass-storage component.

29. (previously presented) The portable media player of claim 28 wherein the processor continuously monitors progress of the codec component in decompressing data in order to:

power up the non-volatile, mass-storage component;

direct the non-volatile, mass-storage component to write additional compressed data to multiple random-access-memory buffers and redirect the codec component to read the additional compressed data from the multiple random-access-memory buffers so that the codec component can continue to generate a decompressed signal without interruption; and

power-down the non-volatile, mass-storage component.

30. (previously presented) The portable media player of claim 29 wherein the processor, following reception of a fast-forward command that redirects rendering, by the data-rendering component, of compressed data starting at a desired location within a compressed-data

sequence not currently stored within the more than two different random-access-memory buffer areas, directs the non-volatile, mass-storage component to write compressed data, starting at a location prior to the desired location in the compressed-data stream and ending at a location following the desired location in the compressed-data stream, to multiple random-access-memory buffers.

31. (previously presented) The portable media player of claim 29 wherein the processor, following reception of a rewind command that redirects rendering, by the data-rendering component, of compressed data starting at a desired location within a compressed-data sequence not currently stored within the more than two different random-access-memory buffer areas, directs the non-volatile, mass-storage component to write compressed data, starting at a location prior to the desired location in the compressed-data stream and ending at a location following the desired location in the compressed-data stream, to multiple random-access-memory buffers.

32. (previously presented) The portable media player of claim 29 wherein the processor, following reception of a rewind command that redirects rendering, by the data-rendering component, of compressed data starting at a desired location within a compressed-data sequence not currently stored within the more than two different random-access-memory buffer areas, directs the non-volatile, mass-storage component to write compressed data, starting at a location prior to the desired location in the compressed-data stream and ending at a location at which subsequent compressed-data of the compressed-data sequence is already stored in the more than two different random-access-memory buffer areas, to multiple random-access-memory buffers.

33. (previously presented) The portable media player of claim 29 wherein the processor, following reception of a fast-forward command, predicts portions of a compressed-data sequence that are likely to be accessed by additional fast-forward commands and directs the non-volatile, mass-storage component to write predicted portions of the compressed data to multiple random-access-memory buffers.

34. (previously presented) The portable media player of claim 29 wherein the processor minimizes the number of times that the processor powers up the non-volatile, mass-storage component.

35. (previously presented) The portable media player of claim 29 wherein the processor minimizes the duration of time during which the non-volatile, mass-storage component is powered up.

36. (previously presented) The portable media player of claim 29 wherein the processor locks only a single random-access-memory buffer at any point in time.

37. (previously presented) The portable media player of claim 29 wherein

the compressed data is a compressed audio signal; and

the decompressed signal is a decompressed audio signal.

EVIDENCE APPENDIX

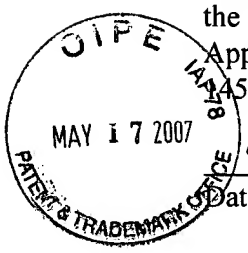
None.

RELATED PROCEEDINGS APPENDIX

None.

PATENT

I hereby certify that on the date specified below, this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to the Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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APPEAL BRIEF TRANSMITTAL

Sir:

Transmitted herewith, is the Appeal Brief in this application, with respect to the Notice of Appeal filed on March 13, 2007. The Commissioner is hereby authorized to charge the fee of $250 for filing this Appeal Brief to Deposit Account No. 50-2976.

Applicants believe that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicants have inadvertently overlooked the need for a petition and fee for extension of time.

The Commissioner is hereby authorized to charge any fees in conjunction with this communication or to credit any overpayment to Deposit Account No. 50-2976. At anytime during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account No. 50-2976 pursuant to 37 CFR 1.25. Additionally, please charge any fees to Deposit Account No. 50-2976 under 37 CFR 1.16 through 1.21 inclusive,

and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. This notice is being submitted in duplicate.

Respectfully submitted,
Eric P. Gibbs et al.
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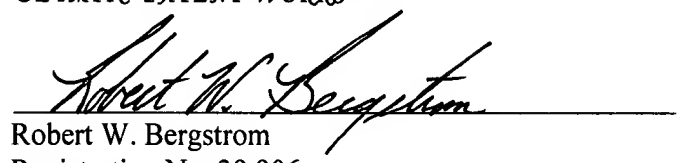

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Appeal Brief
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